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FEESability of Laryngeal Endoscopy Simulation Labs in Student Training: A Scoping Review

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BACKGROUND

- **Laryngeal Endoscopy** is a procedure performed by passing an endoscope transnasally to provide a detailed view of laryngeal structures, including vocal folds.
- Laryngeal Endoscopy is used by a speech-language pathologist (SLP) in voice, speech, and swallowing for diagnostic purposes.
- Flexible Endoscopic Evaluation of Swallowing (FEES) uses laryngeal endoscopy for diagnosis and management of dysphagia and is recognized as an effective tool.
- Simulation training may provide a bridge for students to gain skills and confidence before being introduced to laryngeal endoscopy in a clinical setting.

OBJECTIVE

To review evidence on the use and efficacy of laryngeal endoscopy simulation labs in SLP graduate student training.

METHODS

- **Search strategy:** A multi-engine electronic search was conducted on 1/21/24 in accordance with standards published by the Preferred Reporting for Items for Systematic Reviews and Meta-Analysis protocols (PRISMA). Databases searched: PubMed and Google Scholar.
- **Inclusion criteria:** Tracking student competence after laryngeal endoscopy hands-on simulation training or discuss setting up/ establishing laryngeal endoscopy hands-on simulation labs.
- **Exclusion criteria:** Excluded articles that did not meet inclusion criteria, and/or published languages other than English.
- **Keywords:** laryngeal endoscopy OR nasopharyngeal endoscopy OR stroboscopy OR fiberoptic endoscopic evaluation of swallowing, *AND* simulation OR training OR education OR human patient simulation, *NOT* children OR pediatric OR infant.
- For this review, **Low-Fidelity Models** were defined as simulators designed to enhance specific skills without accurately recreating the procedural environment, and **High-Fidelity Models** were defined as simulators designed to enhance skills while providing a more anatomically accurate procedural environment (Deutschmann et al., 2013).

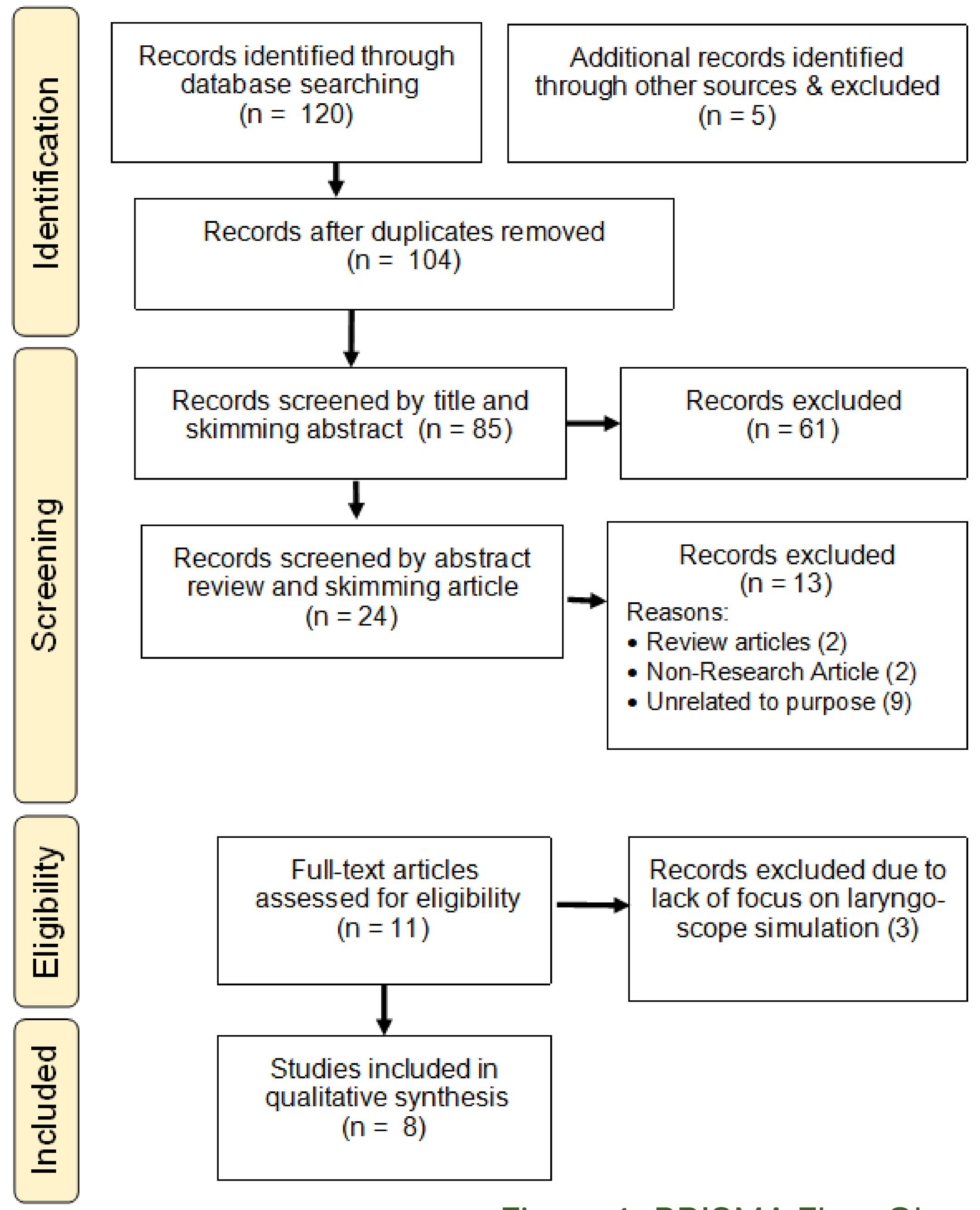

Figure 1. PRISMA Flow Chart

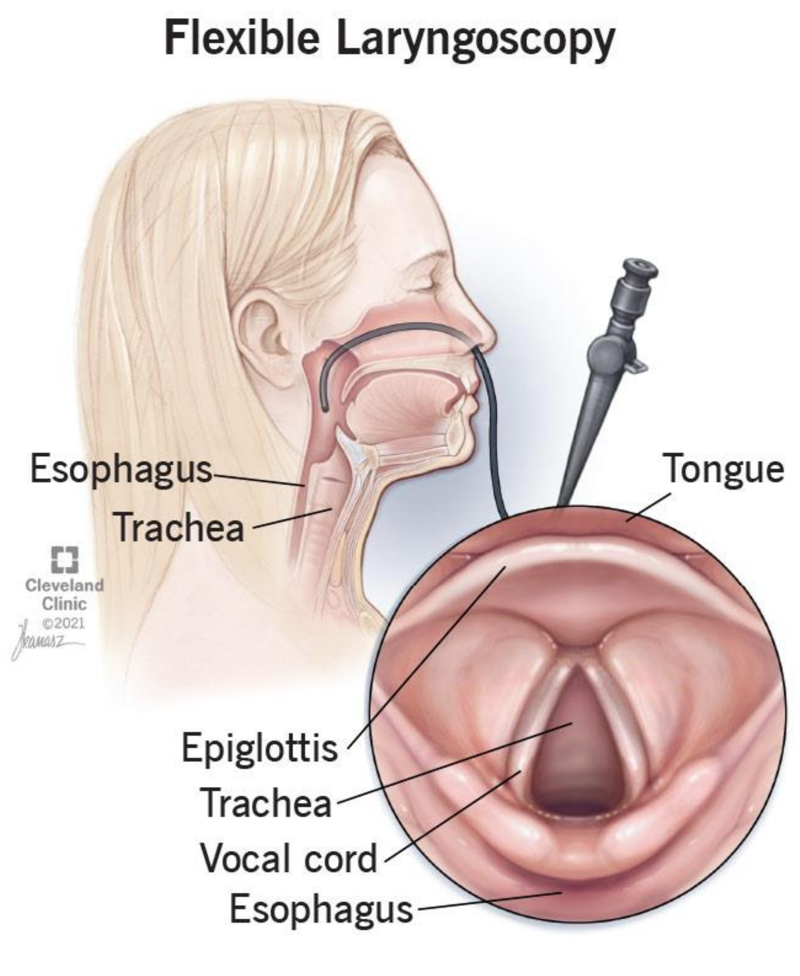

Figure 2. my.clevelandclinic.org

RESULTS

- **Outcome measures** included assessment of anatomical knowledge, procedural fidelity, duration of procedure, student/ trainee confidence, perception of student/trainee skill, and where post-training included a human pass, patient rating of discomfort post-simulation training.
- Across studies that compared a low-fidelity and high-fidelity model simulations (Johnston et al., 2015; Wolford & Wolford, 2020), no significant difference in outcome measures was recorded.
- Ratings of knowledge, skill, and confidence increased with repeated training, regardless of low or high-fidelity models.
- Individuals trained with model simulation (low or high-fidelity) performed better on outcome measures during human passes than control groups who received no prior simulation training (Benadom & Potter, 2011; Deutschmann et al., 2013; Johnston et al., 2015; Ossowski et al., 2008; Smith et al., 2014; Wolford & Wolford, 2020).

Figure 3. High-Fidelity AirSim Model, from https://trucorp.com/en/product/airsim/# (Johnston et al., 2015; Smith et al., 2014)

CONCLUSION

- Simulation training in laryngeal endoscopy and FEES increased student knowledge, skills, and confidence.
- The type of model used (low or high-fidelity) did not significantly impact student learning for initial skill development.

References available upon request.

Figure 4. Low-Fidelity Model (Johnston et al., 2015)

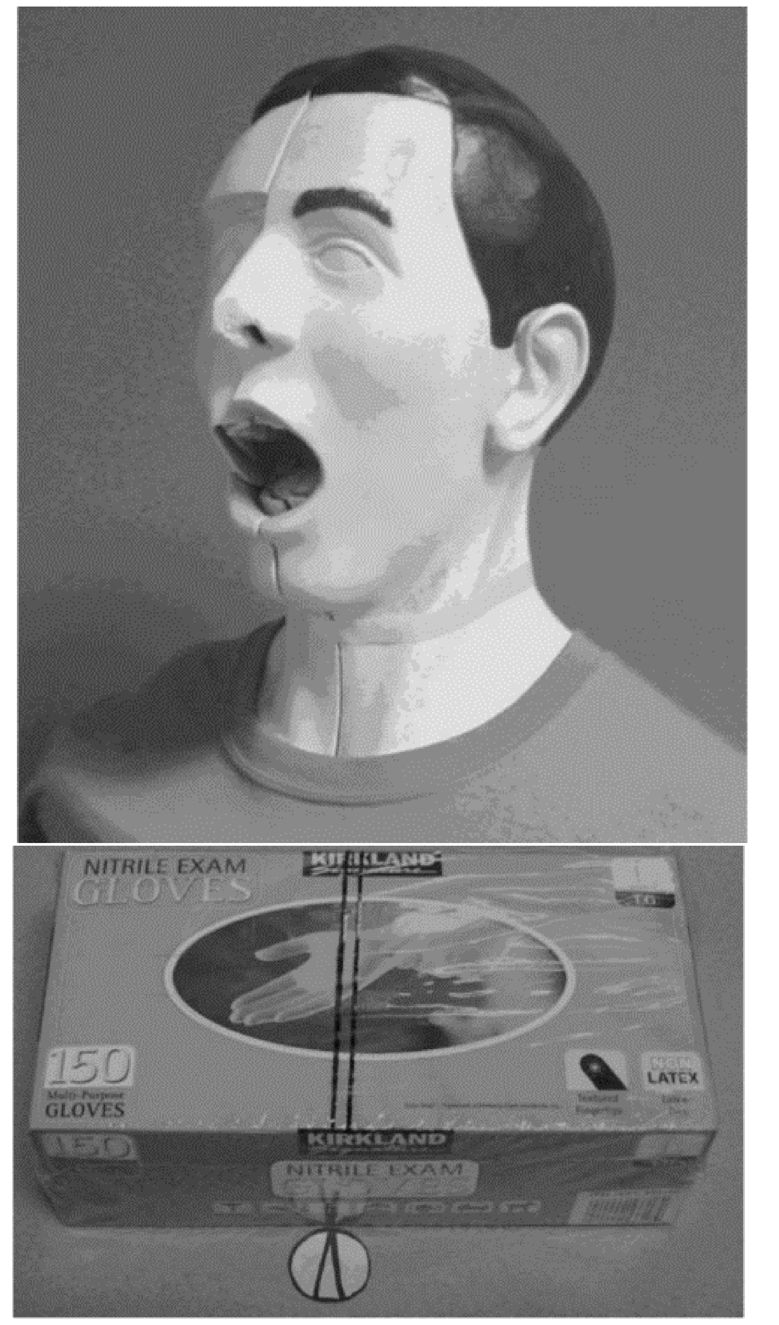

Figure 5 . High-Fidelity Model (top) and Low-Fidelity Model (bottom) (Benadom et al., 2011)